A Direct Interpretation Approach to

English Multiple Sluicing Constructions

1. Introduction

As widely known, a single sluicing construction is an elliptical construction where a single *wh*-phrase stands in for a unary *wh*-interrogative, as shown in (1).

(1) Ben wanted to ask something. I wonder **what.** (Merchant 2001: 41)

Another type of sluicing, a multiple sluicing construction is an elliptical construction where two *wh*-phrases constitute a multiple *wh*-interrogative clause, as in (2). Here, the multiple sluice *who whom* has the meaning equivalent to *who kicked whom.*

(2) I saw that one girl kicked a boy, but I don't know **who whom**. (Bolinger 1978:109)

The analyses of multiple sluicing constructions generally fall into two categories, a deletion-based approach and a direct interpretation approach. A deletion-based approach (Abels and Dayal, 2023; Lasnik, 2014; Merchant, 2001; Nishigauchi, 1998) assumes that the two *wh*-phrases are moved to the left/right end of the clause, while the remaining TP is then deleted. The problem is that English does not permit multiple *wh*-fronting. So different mechanisms were introduced to allow the second *wh*-phrase to survive the TP ellipsis. For instance, Abels and Dayal (2023) suggest that the first *wh*-phrase undergoes a regular *wh*-movement, while a covert *wh*-phrasal movement of the second is rendered overt through ellipsis later,[1] as in (3) below. This sort of approach has several limitations, which will be discussed in Section 2.

(3) a. One of the students spoke to one of the professors, but I don't know **which to which**.
b. …, but I don't know [which]$_i$ [to which]$_j$ [$_{\text{E-site=(TP)}}$ ~~t_i spoke to t_j~~]

On the other hand, a direct interpretation approach (e.g., Park, 2009) assumes that a multiple sluicing construction is generated with merely two *wh*-phrases and no more. In this approach, the key issue is how the form-meaning mismatch can be resolved without resorting to the elided syntactic structure. For instance, Park (2009) assumes that the memory of the semantic structure of the antecedent provides the core meaning to the multiple sluice that follows. However, it also has limitations in that it cannot address wider array of empirical data, such as multiple sluicing across a tensed clause boundary and cases without linguistic antecedents, which will be discussed below.

In this paper, we advocate a direct interpretation approach by illustrating some key data: exceptions to the so-called "clause-mate condition," cases without linguistic antecedents, and examples involving island insensitivity. Then, drawing on Ginzburg and Sag's (2000) HPSG approach to single sluicing, we provide an HPSG analysis to multiple sluicing. Specifically, we show how the Question Under Discussion triggered in the discourse context can provide the basis of the meaning to the multiple sluicing, without resorting to the structural parallelism between a linguistic antecedent and the multiple sluicing construction.

2. Arguments for a Direct Interpretation Approach

[1] Adopting a single cycle-model with a copy or multi-dominance view of phrasal movement, covert and overt movement can occur at the same level. Overt and covert movement are differentiated by which of the copies the chain pronunciation algorithm mandates to be pronounced, the highest one and the lowest one respectively (Gartner 2002). However, when the TP containing the lowest one is elided, the next lowest available copy will be forced to be pronounced, rendering the covert movement overt.

There are a couple of key phenomena that are important in the debate over which approach fits the data of the multiple sluicing construction better. Above all, the correlates of the two *wh*-phrases in a multiple sluicing construction are allegedly prohibited to be separated by a finite clause-boundary. To illustrate, see the contrast between (4) and (5) below.

(4) ***Everybody** claimed that Fred had talked **to some professor**, but I don't know who to which professor. (Abels and Dayal 2023: 434)

(5) **Everybody** talked **to some professor**, but I don't know who to which professor.

This so-called "clause-mate condition" has been one of the strong pieces of evidence for a deletion-based approach. Without assuming an invisible syntactic structure, it is hard to address how multiple sluices exhibit such a distribution.

However, this clause-mate condition is not an absolute constraint. For instance, according to Barros and Frank (2023), when the embedded subject of the antecedent does not shift the attention away from the most salient discourse referent in the previous discourse segment, clause-boundedness is suspended. For instance, in (6) and (7), the embedded subject of the antecedent is an expletive and a negatively quantified expression respectively, both lacking the ability to shift attention away from the most salient discourse referent in the previous discourse segment, *some student* in these cases (i.e., 'non-shifty'). Thus, multiple sluicing across a finite clause boundary is available.

(6) Some student claimed that *there* was a problem with some professor, but I can't recall which student with which professor. (Barros and Frank 2023: 655)

(7) Some student lamented that *no professor* talked about a certain topic, but I can't recall which student about which topic. (ibid.)

Another important thing to note is that multiple sluices do not necessarily accompany a linguistic antecedent, as shown below:

(8) I don't know **who with who**, but I am sure everyone will get hooked up with someone. (Merchant 2006: 286)

(9) A: A couple in our school got married.
B: ?Do you know **who to whom**?

In deletion-based approaches depending on Merchant (2001)'s E-givenness condition (e.g., Abels and Dayal 2023), a multiple sluice must have a linguistic antecedent. This is because, the semantic identity between the antecedent and the following multiple sluice serves as the licensing condition for the ellipsis. Thus, examples like (8) and (9) cannot be accounted for in such a view. On the other hand, a direct interpretation approach itself does not specifically require a linguistic antecedent. So, if an appropriate discourse context is provided, multiple sluicing without a linguistic antecedent can be addressed.

Third, multiple sluices exhibit certain level of island-insensitivity. This is illustrated below:

(10) Linda was moved because everyone prepared for something, but I just don't know **who for what**. (Cortés Rodríguez 2022: 437)

(11) Ben got mad when every student talked to some teacher, but he just couldn't remember **which student to which teacher**. (Cortés Rodríguez 2024: 53)

In (10) and (11), both the correlates of *wh*-phrases belong to an adjunct-island or a *wh*-island. When assuming that the E-site of the multiple sluice contains a syntactic structure isomorphous to the antecedent, it would be faced with the issue of island-violation, since the two *wh*-phrases must be

extracted out of the islands. However, these sentences are grammatical, which seems to be disadvantageous to a deletion-based account.

To resolve this issue, Abels and Dayal (2023) suggest the 'short source approach'. It is to assume that the E-site contains a reduced structure non-isomorphous to the antecedent, yet satisfying Merchant's E-givenness[2] with it. For instance, in the case of (11) above, they assume the E-site as in (12a), instead of (12b). In (12a), since the structure in the E-site does not contain an island, it evades the issue of island violation.

(12) a. …remember [which student]$_i$ [to which teacher]$_j$ [$_{\text{E-site(=TP)}}$ ~~t_i talked to t_j~~]
b. …remember [which student]$_i$ [to which teacher]$_j$ [$_{\text{E-site(=TP)}}$ ~~Ben got mad when t_i talked to t_j~~]

However, this account cannot handle a couple of cases. For instance, see (13) below. In this case, to evade an island, it would have to assume the E-site as in (14).

(13) A: Sally will be surprised if some student wins in some contest.
B: **Which student in which contest?**

(14) [which student]$_i$ [in which contest]$_j$ [$_{\text{E-site}}$ ~~t_i wins t_j~~]

But technically speaking, the antecedent *if some student wins in some contest* cannot entail the E-site in (14), which is mandated by Merchant's E-givenness condition. This is because items in a conditional clause cannot bear an existential presupposition.

3. An HPSG Analysis of Multiple Sluicing Constructions

Thus far, we have illustrated why a direct interpretation approach, over a deletion-based approach, is more favorable in dealing with multiple sluicing constructions. Now, we revise Ginzburg and Sag's (2000) (G&S henceforth) analysis of single sluicing to incorporate multiple sluicing. The reason for this choice is that G&S utilizes the concept of QUD[3] to capture the issue raised in the relevant discourse context and uses it to draw the meaning of multiple sluices.[4] Therefore, it can accommodate discourse context better. Of course, the use of QUD is not unique to its own: AnderBois (2014)'s inquisitive semantics approach to sluicing, for instance, establishes the licensing condition of sluicing based on QUD. However, when applied to multiple sluicing, it encounters a couple of challenges, which will be discussed in the full paper.

Since G&S only tackled the cases of single sluicing constructions, several modifications to the type hierarchy must be made. First, unlike G&S, which regard the type *hd-frag-ph* representing Non-

---

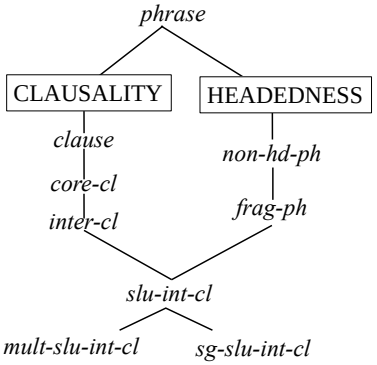
[2] Merchant's E-givenness Condition is as follows:
(i) A constituent E can be deleted iff E is e-GIVEN.
(ii) An expression counts as e-GIVEN iff E has a salient antecedent A and, modulo ∃- type shifting,
a. A entails the Focus closure of E (written F-clo(E)), and E entails F-clo(A)
b. F-clo(α) is the result of replacing F-marked parts of α with ∃-bound variables.

[3] QUD here is a set of currently discussable questions, determined through discourse context. When a certain question becomes maximal in the QUD, either explicitly or implicitly, that maximal QUD functions to shape the flow of information exchange among interlocutors. For instance, when one says *some student died,* the maximal QUD can be a polar question, *did some student die?*

[4] While Ginzburg and Sag (2000) derive the semantic content of a sluice by retrieving a stored parameter from the head daughter—this parameter directly serving as the domain of the question—the INDEX of the associated QUANTS item or the SAL-UTT item is already matched with the stored parameter, obviating the need for an explicit substitution process. In contrast, Ginzburg (2012) spells out a more compositional derivation, wherein the correspondence between the fragment daughter and the FEC (Focus-Establishing Constituent; represents SAL-UTT) is established via the process of substitution. Nevertheless, both accounts share the foundational intuition that sluice interpretation arises from the combination of the Max-QUD (providing the range) and the fragment (providing the domain).

Sentential Utterances (NSUs) as a headed phrase, we revise it into a non-headed phrase, renaming it as *frag-ph*. This is motivated by the fact that the type *hd-frag-ph* does not show a typical property of a headed structure in that the mother ('S') and the head daughter ('NP') do not share categorical identity or semantic headedness. Furthermore, when NSUs are comprised of more than one fragment daughter, they do not constitute a head-mother relationship with none of their daughters.[5] In addition, we change *slu-int-cl*, which originally represented single sluices, into a cover type subsuming *mult-slu-int-cl* (for multiple sluices) and *sg-slu-int-cl* (for single sluices). The following (15) shows the modified type hierarchy:

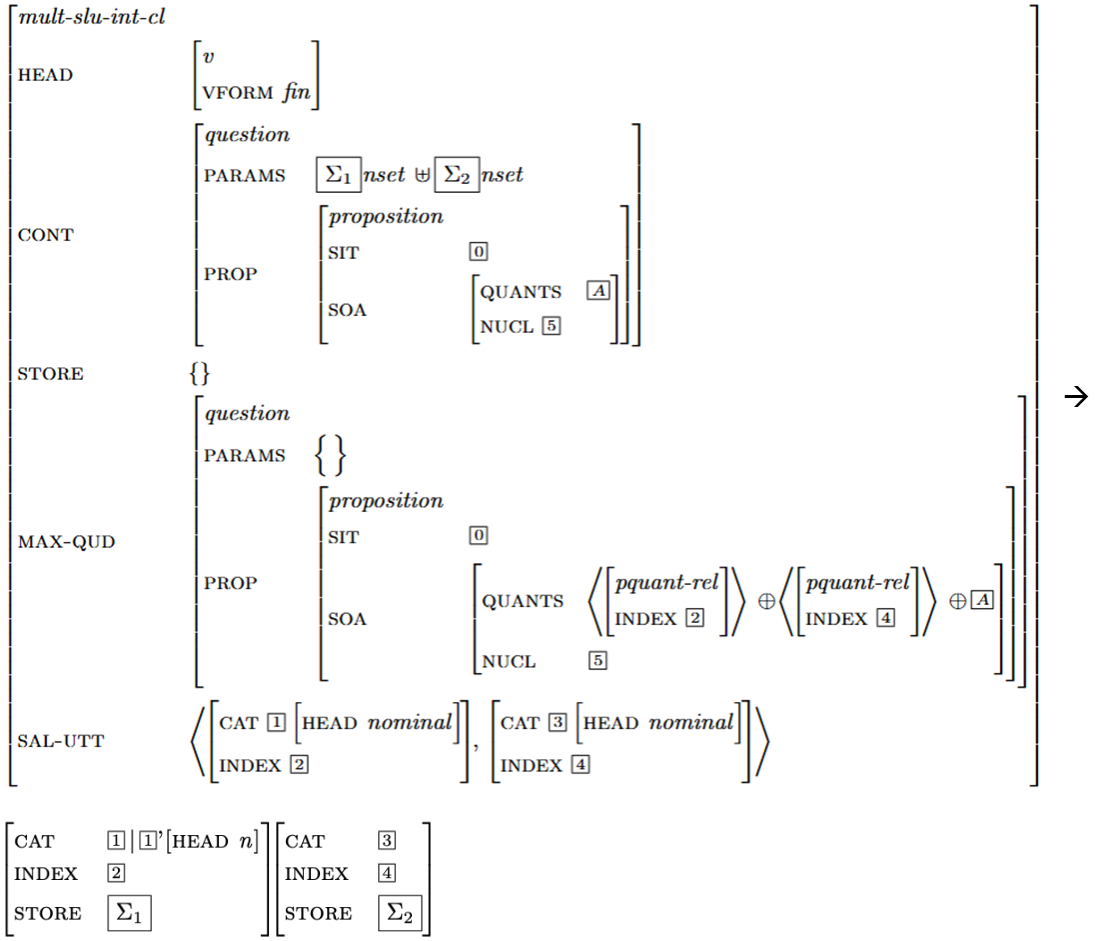
(15) Modified Type Hierarchy Associated with *slu-int-cl*



Now, the structure in (16) below illustrates all the inherited constraints on *mult-slu-int-cl*.

[5] One complication involved with this modification is that the Interrogative Retrieval Constraint (IRC) governing the *wh*-retrieval in *wh*-interrogatives is defined in terms of head-mother relationship. Thus, to enable *wh*-retrieval in multiple sluices, it is necessary to also revise the IRC. This will be presented in the full paper.

(16) The inherited constraints on *mult-slu-int-cl*[6] [7]



Here, the maximal QUD of the mother has two wide scoping positive quantifiers in its QUANTS list, which represent items associated with each *wh*-fragment, or linguistic correlates if they exist.[8] What is important to note here is that triggering a maximal QUD is not necessarily dependent on the existence of a linguistic antecedent. Even in cases without a linguistic antecedent, as in (9), relevant

[6] One reviewer pointed out the risk of over-generating marginal multiple sluicing examples, where both *wh*-fragments are identical (e.g., *who who, which student which student*). We take this to reflect a more general cognitive tendency: the more structurally or semantically informative the fragments are, the easier it is to recover the intended meaning in elliptical contexts. That is, the difficulty in interpreting such examples arises because it is unclear how the two identical fragments are associated with distinct roles in the event structure. This also helps explain prior observations that multiple sluices become more acceptable when the second fragment is a PP or a heavy NP (e.g., *who to whom*, *which student from which department*), as these provide additional cues for semantic reconstruction. While we do not encode this as a formal constraint in our feature structure, we acknowledge it as a relevant processing factor.

[7] One reviewer suggested unifying single and multiple sluicing under a single *slu-int-cl* type with DTRS value of *ne-list*. However, we maintain a distinction between *sg-slu-int-cl* and *mult-slu-int-cl* for a couple of reasons. First, the two *wh*-fragments in multiple sluicing show different syntactic behaviors—the first allows P-stranding, while the second does not—suggesting they should not be treated as multiplication of identical types. Second, since our analysis relies on a fixed order between the daughters and their corresponding SAL-UTT, QUANTS, and PARAMS values, using a *ne-list* would obscure this alignment.

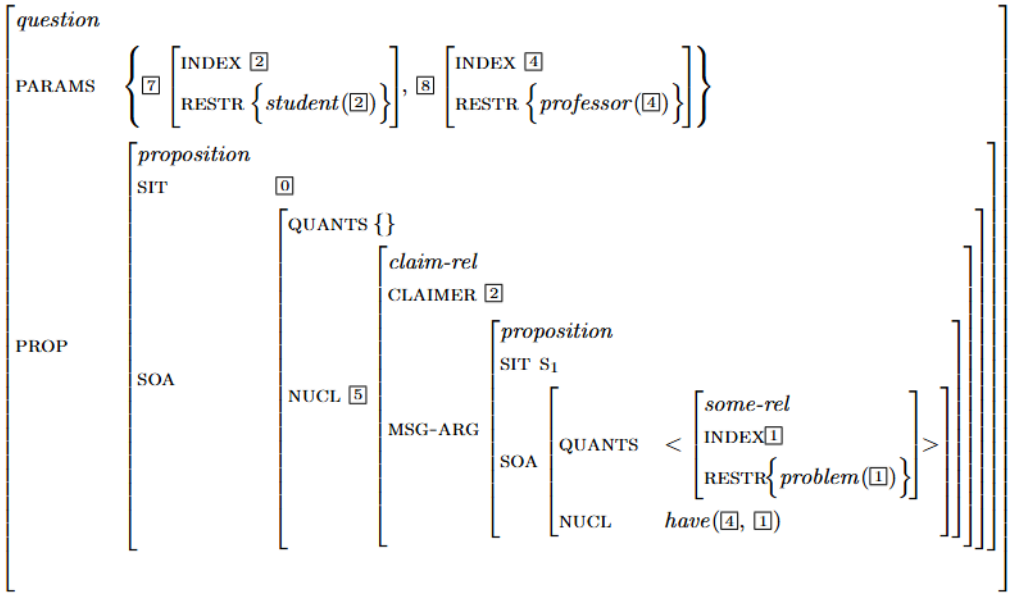
[8] For instance, in the case of (5), the MAX-QUD here would be 'is it true that everybody talked to some professor?' And the two wide-scoping quantifiers in its QUANTS list would be the quantifier relations associated with *everybody* and *some professor.*

maximal QUD (e.g., 'is it true that a couple in our school got married?') can be triggered via discourse context, which provides a solution to cases without a linguistic antecedent.

Then, as can be seen from the CONT of the mother, the SIT (situation index) and NUCL (core semantic relation) of the question serving as the mother's content is drawn from those of the MAX-QUD. It indicates that the mother's meaning is largely drawn from that of the MAX-QUD. One big difference is that the mother will have a non-empty PARAMS set, filled with two sets of parameters each contributed by its fragment daughters. Thus, the construction as a whole ends up querying the identity of the pairs of individuals/ entities associated with the two *wh*-fragments.

Since we have posited no semantic structural constraint on the CONT of this construction, multiple sluicing across a finite clause-boundary in (6) above can be addressed with a nested CONT value, as in (17).

(17) The CONT of the Multiple Sluice in (6)



Finally, we highlight the contrast between single and multiple sluicing under accommodation-resisting predicates like *deny* and *doubt*. While single sluicing remains acceptable in these contexts, multiple sluicing becomes degraded:

(18) A: Fred **denied/doubted** that a certain boy talked to a certain girl.
B: ???I wish I could remember which boy to what girl. (Lasnik 2014: 13)

(19) A: Fred **denied/doubted** that a certain boy talked to a certain girl.
B: I wish I could remember which boy. (ibid.)

In our view, this asymmetry suggests that the speaker should (at least tentatively or hypothetically) accommodate the propositional argument of the maximal QUD even if it is not explicitly asserted. Specifically, we assume that there is a pragmatic constraint that requires that a multiple sluicing construction be licensed only if the propositional argument of the maximal QUD is either presupposed or contextually accommodatable.

In Section 2, we have outlined a range of empirical or theoretical challenges posed by multiple sluicing constructions. While space limitations prevent a full treatment here, the full paper will offer more detailed analyses of the problematic cases introduced above, illustrating how the proposed approach can systematically account for them within the HPSG framework.

References

Abels, K., & Dayal, V. (2023). On the syntax of multiple sluicing and what it tells us about *wh*-scope taking. *Linguistic Inquiry, 54*(3), 429-477.

AnderBois, S. (2014). The semantics of sluicing: Beyond truth conditions. *Language, 90*(4), 887-926.

Barros, M., & Frank, R. (2023). Attention and locality: On clause-boundedness and its exceptions in multiple sluicing. *Linguistic Inquiry, 54*(4), 649-684.

Bolinger, D. (1978). Asking more than one thing at a time. In H. Hiż (Eds.), *Questions* (pp. 107-150). Springer Netherlands.

Cortés Rodríguez, Á. (2022). Multiple sluicing and islands: a cross-linguistic experimental investigation of the clausemate condition. *The Linguistic Review*, *39*(3), 425-455.

Cortés Rodríguez, Á. (2024). Multiple sluicing through an experimental lens: Amelioration effects, crosslinguistic variation, and processing [Doctoral dissertation in preparation]. Eberhard Karls Universität Tübingen.

Gartner, H. M. (2002). *Generalized transformations and beyond: Reflections on minimalist syntax.* Akademie Verlag.

Ginzburg, J., & Sag, I. (2000). *Interrogative investigations*. CSLI publications.

Lasnik, H. (2014). Multiple sluicing in English? *Syntax, 17*(1), 1-20.

Merchant, J. (2001). *The syntax of silence: Sluicing, islands, and the theory of ellipsis*. Oxford University Press.

Merchant, J. (2006). 'Small structures': A sententialist perspective. In L. Progovac, K. Paesani, E. Casielles-Suárez, & E. Barton (Eds*.), The syntax of nonsententials: Multidisciplinary perspectives* (pp. 73-91). John Benjamins.

Nishigauchi, T. (1998). 'Multiple sluicing' in Japanese and the functional nature of *wh*-phrases. *Journal of East Asian Linguistics, 7*(2), 121-152.

Park, S. H. (2009). Resolving Multiple *Wh*-Fragments: A Syntax-Pragmatics Approach. In O. Kwong (Eds.), *Proceedings of the 23rd Pacific Asia Conference on Language, Information and Computation Volume 1* (pp. 435-443). City University of Hong Kong Press. https://aclanthology.org/Y09-2001